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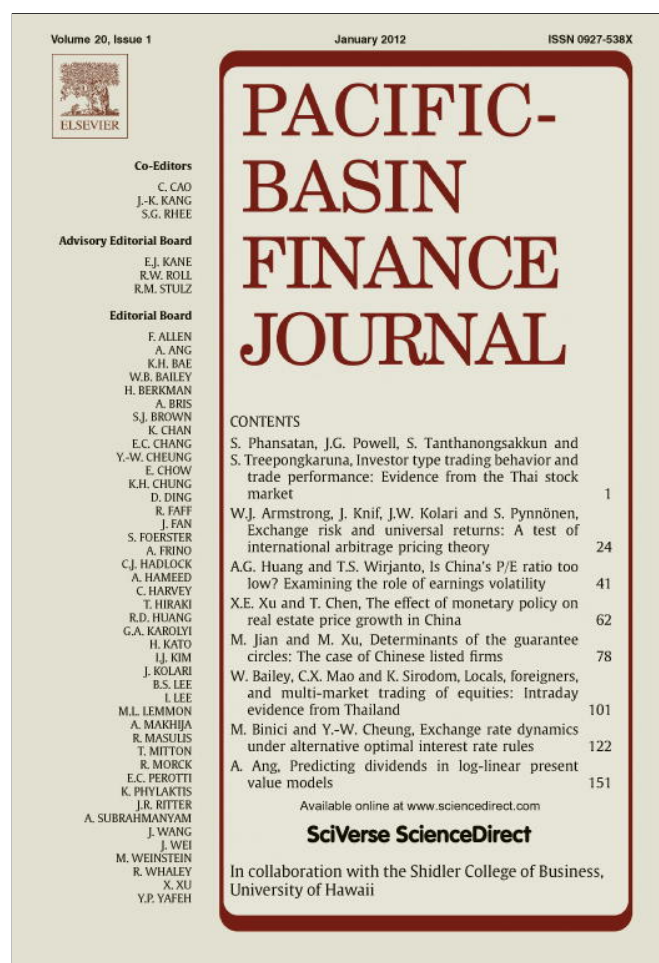
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Impact of late payment on Firms' profitability: Empirical evidence from Malaysia

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ABSTRACT

This paper examines whether late payment (LP) by customers impacts firms' profitability, using a cross-sectional sample of 287 Malaysian public-listed manufacturing firms for the financial year 2007. This is an important issue given that trade credit is commonly seen as a significant short-term financing practice in Asia. However, in Malaysia, trade credit has not been explored, largely due to the unavailability of relevant published data and the reluctance of firms to divulge information regarding their trade credit practices. To overcome this, we suggest a new measure of LP using the Pareto 80:20 rule to take cognisance of local nuances and industry practice, and argue that Pareto Days Overdue is an appropriate measure of LP for Malaysia. We find that 60% of the sampled firms experience LP and LP has a significant inverse effect on their profitability; and those with shorter credit terms and Days Sales Outstanding (DSO) perform better than those with longer credit terms and longer DSO. The paper also discusses implications for policy makers and regulators since the accounting rules related to the disclosure of receivables in Malaysia are converging towards the International Financial Reporting Standards (IFRS).

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1. Introduction

Trade credit (TC) is the transaction between the provision of goods/services and delayed payment for them. But if payment is not received as per the agreed date then this gives rise to LP. Thus LP occurs when the collection period *exceeds* the credit period granted to customers. It is often argued that prolonged periods of debt collection increase the cost of granting credit (Summers and Wilson, 2000). There is,

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however, only limited evidence as to whether LP impacts on firms' profitability, especially in the case of emerging markets. In most developed countries, TC exceeds short-term bank credit (Blasio, 2003) and is an important way of financing firms' working capital (Peel and Wilson, 1996). In the UK, for instance, more than 80% of business-to-business transactions take place on credit (Paul and Wilson, 2006; Wilson and Summers, 2002). This extensive use of TC, however, brings with it very serious risks of LP or default which affects firms' cash-flow and profit. There are increasing calls for enhanced disclosures of a firm's exposure to risks and how these are managed (IASC Foundation, 2009). Increasingly, credit risks are being investigated in the more developed Western economies (Paul and Boden, 2008).

Many suggest that TC can offer significant competitive advantage to suppliers,² enhancing sales and profitability; these benefits are often promoted as the reason for its widespread availability (Wells, 2004; Summers and Wilson, 2003; Paul, 2010). However, TC extension only leads to additional profit if it is used judiciously. Generally speaking, profit is often viewed as a function of invoiced sales; but in the context of credit sales, this accounting concept needs to be played down in favour of the financial management concept, which sees cash generation as a function of receipts from customers.³ Thus profit on credit sales only materialises when cash is collected and any LPs increase costs and therefore decrease profit. Moreover, the judicious use of TC may increase profit and more profitable firms in turn have greater ability to offer TC.

TC is seen as a 'means by which money is transferred from economic entities that have idle money balances to entities which need additional money balances' and is part of the money supply (Laffer, 1970, p242). Contrary to findings in more advanced Western economies (Cuñat, 2007; Wilner, 2000; Petersen and Rajan, 1997), firms in Thailand, Korea, the Philippines and Indonesia reduced the value of account receivables and the period of TC extensions to their customers after the Asian crisis (Love and Zaidi, 2010). Unlike the experience in the USA (Shenoy and Williams, 2011), firms in Asia do not use TC to generate business by 'lending a helping hand' to financially constrained customers (Love and Zaidi, 2010).

In emerging economies, especially those in Asia, academic discourses concerning TC are limited (Zainudin, 2008; Love and Zaidi, 2010). Given the cultural, regulatory and business environment differences (Sun et al., 2010), an examination of TC from an Asian perspective is useful and timely. Furthermore, the adoption of International Financial Reporting Standard (IFRS) 7, *Financial Instruments: Disclosures*⁴ issued by the International Accounting Standards Board (IASB), is occurring in many jurisdictions around the world. We expect the collectability of receivables to be given greater attention, especially in emerging economies, as it poses significant risks to profitability. Principally IFRS 7 aims to provide the users of financial statements with valuable information about an entity's exposure to receivable's risk and how this risk is managed. In so doing, IFRS 7 brings many disclosures previously required only of banks and financial institutions into the ambit of ordinary trading entities (BDO, 2008). The question we pose is whether LP affects profitability and consequently whether information relating to the credit period extended to customers, and the incidence of LP, is useful to the readers of financial statements.

This paper argues that, for two main reasons, the Malaysian capital market offers an interesting setting in which TC issues are explored. Firstly, many countries in the Asian region have announced their intention to adopt IFRSs. Its implementation in these jurisdictions may still impose significant challenge; but nevertheless, Malaysia has already made significant strides towards convergence by 2012. Secondly, the Malaysian institutional context is intriguing because unlike the more developed Western economies, where legislation mandates disclosure of payment patterns of commercial debts, in Malaysia, until the advent of IFRS 7, no such legislation existed (KPMG, 2008). Furthermore, the political economy of Malaysia, with its extensive evidence of relationship capitalism (Mitchell and Joseph, 2010), makes it an interesting case.

This paper also departs from the extant TC literature in at least three significant aspects. Firstly, it extends Asian TC management literature by empirically quantifying LP of account receivables using Malaysian data. Secondly, it introduces a new measure of LP based on the Pareto 80:20 rule to investigate LP and its effect on profitability. The paper argues that the Pareto rule is widely used in business management and better reflects the customer–sales relationship (Rodd, 1996). Furthermore, prior studies use the average collection period instead but neither provided any *justification* nor evidenced any *empirical* support for such a measure of LP (Zainudin, 2008). Zainudin (2008), for instance, explored the

² For more on this see Paul and Boden, 2008.

³ For more on the accounting and financial management concepts see Management Accounting, January 1997, Vol. 75 No 1, CIMA.

⁴ Further amendments to IFRS 7 were issued in March 2009.

collection period *profile* of some Malaysian SMEs and looked at whether different industry sectors and size were related to the collection period, which, he found affected companies' performance. However, in his paper he concluded that 'issues on LP, which need more urgent attention, were not considered' (p82). By extending the work of Zainudin, the first aim of this paper is thus to contribute to the limited evidence on LP in Malaysia by empirically testing for LP. We use three different measures to explore the LP issue and argue that it is important to compute the average days that payments *exceed* the credit period by using a measure that reflects better the *spread* of LP in the Malaysian manufacturing sector. Pike and Cheng (2001), for instance, use the concept of average days overdue; nevertheless, the rationale for this is not clear except that information on average collection period is disclosed in the financial statements. However, we posit that this measure does not objectively reflect LP in Malaysia and further modify this measure by applying the Pareto rule. Moreover, in Malaysia, the legal process for debt recovery is tedious, time-consuming and costly (Thomas, 2002). Debtor recovery is a civil suit and is open to technical arguments and commercial disputes over the subject matter. The claimant is required to prove the debt owing on a *prima facie* basis, and then further court action is required for enforcing the judgement obtained. Thirdly, we evidence that there is an association between LP and the profitability of Malaysian manufacturing firms. Thus information regarding the credit period extended to customers (as required by IFRS 7) is important for users of financial statements in evaluating business performance.

The rest of the paper is organised as follows: Section 2 examines the existing literature on TC and LP; Section 3 presents the hypothesis development, variables definition and research models; Sections 4 and 5 present and discuss our results; and Section 6 concludes.

2. Trade credit and late payments

2.1. Trade credit practice in Asia

The scale of TC is significant in most countries, often replacing short-term bank credit, and can be an important way of financing firms' working capital (Peel and Wilson, 1996; Paul and Boden, 2008; Shenoy and Williams, 2011), so disclosures of how effectively firms manage their TC are of interest to stakeholders and potential investors.

Within Asia, the less developed countries rely more on TC than those with more advanced trading systems and this is shown by longer credit periods (Ge and Qiu, 2006). For example, India has the longest credit period (90 days), followed by Malaysia (30 to 90 days), whilst Hong Kong and Singapore tend to have a shorter credit period (30 days). Interestingly, even in Europe, countries in the South tend to have longer credit periods than those in the North. In Eastern Europe, owing to the restricted availability of bank finance, accounts payable⁵ to total liabilities vary between 21% (Hungary) and 49% (Bulgaria) (Delannay and Weill, 2004), and for the same reasons, private sector firms in China rely heavily on longer credit terms (Ge and Qiu, 2006).

Malaysia represents an interesting case study in Asia for three reasons. Firstly, the average credit period extended to customers is twice that of firms in developed countries globally (Infocredit, 2005). This implies the higher TC costs of extending credit and the higher risks carried accordingly. Secondly, the average collection period (ACP) or DSO⁶ is 86 days, much higher than the simple average of 60 days (mean between 30 and 90 days) and is skewed to the longer end of the 30–90 day continuum, indicating the higher risks of LP. Thirdly, disclosures of the risks of collection are not evident as regulation stipulating such disclosures is in its infancy (enforceable for financial statements beginning on or after 1 January 2010, MASB, 2011b). However, it is anticipated that many firms may not be ready to adopt IFRS 7 within the given time frame (PWC, 2007; KPMG, 2008). This study is timely as the accounting rules related to the disclosure of receivables exposure in Asia will follow IFRS; and Malaysia, as other countries in the region, has committed to IFRSs by 2012 (MASB, 2011a).

⁵ The reverse of accounts receivable, measures the amount of credit that a firm received from its suppliers and still unpaid on the balance sheet date.

⁶ DSO is an important indicator of how long it takes to collect the sales revenue. It measures the average number of days that a firm takes to collect its revenue after a sale is made (www.investopedia.com). In this paper, it is derived from the year-end debtors' balance divided by the annual turnover multiplied by 365 days.

2.2. Legislation governing trade credit practices

Legislation to combat LP problems has been introduced in more advanced economies such as in the EU⁷ but LP is still a major problem affecting firms' liquidity, profitability and even survival in some cases (Paul and Wilson, 2006). The legislation aims to encourage customers to pay on the agreed terms with the objective of changing payment behaviour by creating a level 'paying' field (Paul, 2010). Nevertheless, Paul and Boden (2008) argue that despite the legislation, LP persists, often due to management failure. It is reported that the LP problem costs the UK economy £20 billion a year (Accountants Today, 2007). Furthermore, the recent global financial crisis has compounded the significance of LP and the need for managing receivables in today's businesses. For some, TC is the only way to access short-term finance and it is often found to be crucial for firms that are rationed by banks (Burkart et al., 2008). It is reported that TC is one of the least researched of all financial instruments (Paul and Guermat, 2011).

In Asia, especially in less developed countries such as Malaysia, the issues of TC management and LP concerns are relatively unexplored and research into LP and its association with profitability is very limited (Zainudin, 2008), although the problem of debt collection and many aspects of TC are increasingly visible (Angappan and Zainudin, 2003; Love et al., 2007). For example, certain Malaysian firms are increasingly scrutinised for their high level of receivables and nearly 25% of non-financial firms (listed on the Main Board of Bursa Malaysia⁸) have receivables representing more than half of their reported group revenue (The Edge, 2007).

The lack of research in this area is due to the historical unavailability of credit period information to compute the overdue days and to derive LP (Zainudin, 2008). However, with the adoption of IFRS 7, *Financial Instruments: Disclosures*, in many jurisdictions around the world, we expect that the collectability of account receivables exposure may gain the attention it deserves, especially in the emerging economies, as problems related to the recovery of the credit extended pose significant risks.

2.3. Late payment and its impact on profitability

There are many reasons for the occurrence of LP. Firstly, LP is often a function of poor business practices, inefficient credit management and unclear credit terms (Paul, 2007). Secondly, weak financial and working capital practices contribute to LP problems (Wilson, 2008; Paul and Boden, 2008). Thirdly, the quality of products and customer service plays a role, as unsatisfied customers will withhold their payments (Wilson, 2008; Pike and Cheng, 2001). Fourthly, economic conditions matter as LP and bad debts often increase when economies move into recession since TC suppliers carry an inordinate amount of risk as their customers struggle to survive (Wilson, 2008). Firms in financial difficulty often stretch their creditors in order to alleviate their own cash-flow problems (Wilson, 2008). Thus firms that have difficulty raising finance face the problem of balancing cash inflows–outflows and LP is both a cause and effect of this problem (Howorth and Wilson, 1998). Furthermore, when faced with cash shortages, firms find it cheaper to delay payment than to renegotiate bank loans (Garcia-Teruel and Martinez-Solano, 2010).

Since receivables are a significant part of working capital management, they impact firm performance (Smith, 1987). For instance manufacturing firms, which tend to have high levels of inventory as well as receivables, may find their profitability reduced due to the risks of obsolescence and uncollected debt respectively. So both inventory and TC management affecting firms' cash conversion cycle (CCC)⁹ are crucial to their liquidity and profitability.

LP increases the need for additional working capital (Chittenden and Bragg, 1997) since suppliers of TC are compelled to raise funds to finance their additional working capital requirement from other sources such as debts or equity. If working capital cannot be increased using other's sources of funds, delayed payment by customers is often balanced in turn by delayed payments to their own suppliers (domino effect). When profitability is constrained TC management becomes vital and better collection procedure helps improve profitability. Therefore the collection period is an important factor that affects firms' performance (Zainudin, 2008).

⁷ UK Late Payment of Commercial Debts (Interest) Act 1998, amended in 2000 and 2002; and New Directive 2011/7/EU replaces Directive 2000/35/EC (Official Journal of the European Union, February 2011).

⁸ Malaysian Bourse, the stock and commodity futures exchanges of Malaysia, Formerly known as the Kuala Lumpur Stock Exchange.

⁹ CCC = Days sales outstanding + Days of sales in inventory – Days of payables outstanding.

Evidence from the more advanced economies on the impact of LP is increasing. Some use DSO to investigate the CCC and its impact on firms' profitability (Garcia-Teruel and Martinez-Solano, 2010; Deloof, 2003; Shin and Soenen, 1998). Deloof (2003) and Garcia-Teruel and Martinez-Solano (2010), for instance, find that firms with lower DSO have higher profitability (and vice versa). Others argue that DSO is sector specific: using published financial statements from 1990 to 2000, Angappan and Zainudin (2003) investigate the credit collection period in Malaysia and find that different sectors have different DSO levels. In addition, they report that DSO is lower before the advent of the 1997 Asian financial crisis than after. Others still relate LP to economic crises (Zainudin, 2008). However, when examining the DSO of 279 Malaysian SMEs (between 1999 and 2002), Zainudin (2008) finds a negative correlation between the collection period and firms' financial performance. He, nevertheless, reports that although LP issues need urgent investigation, the lack of reliable information relating to *actual* credit periods, makes it difficult to measure LP and its effects on Malaysian businesses.

2.4. Measuring late payment

Being an emerging economy as well as a member of the Commonwealth, most of Malaysia's legislation is modelled on British Law prior to independence in 1957. However, over time, legislation has evolved to reflect local nuances whilst being cognisant of developments in other countries. The issue of LP came to light with the highly publicised corporate scandals (Transmile and Megan Media in particular) involving long DSOs (The Edge, July, 2007). Although in Malaysia the most common credit period is between 30 and 90 days,¹⁰ it is found, that for the financial year 2006–2007, there were 177 Main and Second Board firms listed on Bursa (about 18% of total listed firms) with receivables amounting to at least 50% of their sales (The Edge, July, 2007). This translates to a DSO of over 180 days, at least twice as long as the normal credit period granted which is a gap of 100% between the actual DSO and the common credit period. This, indirectly, camouflages the LP problem, which despite its extent, is thus not clearly discerned by regulators as the information disclosed is not usually analysed in greater detail. Moreover, in Malaysia, most firms disclose a range of days (usually 30 to 90) as their *average* credit period granted. As such, several baseline credit terms exist in the credit period granted and so the DSO measure is not the most appropriate indicator of LP (Zainudin, 2008). In contrast, in advanced economies such as the US and EU, debtor days and creditor days are normally stated as single average figures. Pike and Cheng (2001), for instance, use DODA as a measure of UK LP (average number of days in excess of debtor days over the normal credit period). However, this measure may also be problematic and one needs to be cautious in interpreting the variations in payment periods; poor payment practices may reflect changes/flexibility in credit periods rather than increases/decreases in overdue periods (Wilson, 2008).

Prior studies on LP carried out in developed countries have used measures of LP such as DODA whilst the only study from an emerging country merely examines the relationship between the collection period and profitability since an appropriate measure of LP cannot be obtained due to information unavailability (Angappan, and Zainudin, 2003). Thus there is limited evidence on the impact of LP on firms' profitability in emerging markets. Given the concern over the applicability in the Asian context of these findings, sourced from developed countries, and given the unavailability of relevant local information, a new matrix of computing LP from published data is necessary. By applying the Pareto rule to TC extensions, this paper attempts to provide a more realistic measure of LP of receivables in the context of an emerging country. Whilst the LP measure is based on Pike and Cheng (2001), it is modified to use the Pareto 80:20 rule on days overdue instead of average days overdue. The justification for using the Pareto rule is discussed in Section 3.

3. Hypothesis, variable description and model specification

3.1. Hypothesis

The underlying hypothesis is that higher LP days will be associated with lower profitability. Through TC suppliers finance the inventory and bear the financing cost of their customers, especially those that are financially constrained; often suppliers 'ease this constraint by financing the growth of their customers with trade credit loans' (Schwartz, 1974, p652). If customers then take longer to pay (LP), the cost of financing

¹⁰ www.intrum.com.

increases, thus reducing profit. So, LP not only affects suppliers' cash-flow, increases their bad debt and the cost of chasing overdues, but it also ultimately increases the need for short-term finance (higher cost of borrowing), and thus reduces profitability. The consequences of slow payment include the erosion of firms' profitability and, in some cases where profit margins are tight, its complete elimination (Wilson et al., 1997). Moreover, in cases where there is customer concentration, LP may even lead to insolvency (Paul and Boden, 2011a, 2011b). Effectively we expect a statistically negative association between LP and profitability.

3.2. Dependent variable: operating income return on investment (OIROI)

The dependent variable used is the operating return on assets derived from operating income over total assets (OIROI) instead of the commonly used return on assets derived from net income over total assets (ROA). Due to the fact that the data are in group consolidated form, and to minimise the effect of non-trade related business activities, operating profits/losses would be the most appropriate proxy for profitability (DeLoof and Jegers, 1996; Deloof, 2003).

Longenecker et al. (2008) define OIROI as the operating income to total assets of manufacturing firms and it is one of the ratios that measure the operating efficiency of firms' assets. Furthermore, OIROI reflects product pricing and firms' ability to keep costs down as it measures the level of profit relative to the total assets, thus, showing the income generated per unit of currency of assets. In addition, OIROI is sometimes used interchangeably with operating profit over total assets. This can be stated in ways that integrate the use of DuPont analysis¹¹ with financial ratios:

- (1) $\text{OIROI} = \text{Operating Income} / \text{Total Assets}$, or
- (2) $\text{OIROI} = \text{Operating Profit Margin} \times \text{Total Asset Turnover}$, or
- (3) $\text{OIROI} = \text{Operating Income} / \text{Sales} \times \text{Sales} / \text{Total Assets}$

Similar to OIROI, the key to success in TC is the effective management of credit extension and collection of debts in order to maximise profitability and revenues but minimise costs such as bad debts and recovery costs (Paul, 2010). LP of receivables thus indicates management ineffectiveness, as there is an inverse relationship between LP and management effectiveness, i.e. firms suffering LP are expected to have a lower OIROI. Consistent with previous related works, OIROI is the most suitable proxy for measuring TC collection performance and LP (Deloof, 2003; Garcia-Teruel and Martinez-Solano, 2007; Zainudin, 2008).

3.3. Independent variable measurement: late payment

This paper employs three different measures to proxy LP, which reflect payments received *after* the credit period expires (Table 1).

(a) Days sales outstanding (DSO) Model 1

The first measure of LP is the actual collection period (DSO) which represents the average number of days that the firm takes to collect payments. The higher the DSO value, the higher the firm's level of receivables and thus the lower the collection promptness (DeLoof, 2003; Garcia-Teruel and Martinez-Solano, 2007; Zainudin, 2008). As mentioned earlier DSO is not a good proxy for LP but it is rather a measure of collection promptness. LP is focused on payments received after the expiry of the credit period granted.

(b) Average days overdue (DODA) Model 2

The second measure is the average days overdue (DODA). It is the explanatory variable for LP used in previous studies (Pike and Cheng, 2001; 2002) and days overdue occur when DSO exceeds the credit period granted. Accordingly, DODA is the difference between the average collection period (ACP) and the average credit period granted (Average CT), i.e. when DSO is longer than Average CT. This measure is indicative not just of the promptness of collection but also the collection exceeding the credit period.

¹¹ Du Pont analysis is a method of performance measurement that was started by the DuPont Corporation in the 1920s, and has been used by them ever since. Under this method, assets are measured at their gross rather than net book value in order to produce a higher return on investment (ROI). (Source: <http://dictionary.reference.com>).

Table 1

Descriptive analysis on independent and dependent variables.

	Mean	Median	Std. De.	Maximum	Minimum
OIROI	3.79	4.70	15.61	218.54	– 98.05
DSO	89.271	79.694	56.686	445.122	0.779
DODA	17.873	10.829	50.021	286.304	– 146.368
DODP	3.533	4.386	61.082	292.122	– 235.075
SIZE	2.369	2.276	0.498	4.079	1.417
GROWTHPOS	0.275	0.109	1.098	15.564	0.000
GROWTHNEG	– 0.053	0.000	0.130	0.035	– 0.872
DEBTTL	0.465	0.498	0.263	0.910	0.000

(c) Pareto days overdue (DODP) Model 3

The third proxy for LP is days overdue based on Pareto rules (DODP). This measure is similar to [Pike and Cheng's \(2001\)](#) DODA except that the simple averaging of credit period is replaced with the use of the Pareto principle in determining the collection period. The key contribution of this paper is determining the impact of LP by customers on the profitability of Malaysian manufacturing firms. This involves constructing a measure that *truly* reflects the LP phenomenon in an emerging country as against the simple average which assumes that the credit terms are spread evenly. This is in line with the results obtained from our preliminary study that show that most of the Malaysian manufacturing sector's receivables are paid late. We introduce a new measurement for LP using the Pareto principle on days overdue in lieu of simple averaging as in DODA. Most firms find that the pattern of their sales ledger follows, to a greater/lesser degree, the Pareto principle and this has been applied to sales revenue management in past decades. In economics, the Pareto principle posits the relationship between the vital few and the trivial many and, in essence, shows that approximately 80% of the total wealth in a society lies with only 20% of families ([McClave and Sincich, 2009](#)). The Pareto rule is used extensively in management accounting and is embedded in much of the world's business thinking ([Rodd, 1996](#); [Alvis et al., 2008](#)). Thus we postulate that the pattern of payment of the Malaysian manufacturing firms' credit period granted is aligned with the Pareto 80:20 rule. In terms of credit granting we expect 80% of customers to be extended 30 days credit whilst the remaining important 20% enjoy 90 days. However, we find that only 20% of customers pay within 30 days and the remaining 80% pay well beyond the agreed date. Thus, based on financial reporting disclosure, the average collection period and the DSO of sampled companies are skewed to prolonged credit days and therefore we apply the 80:20 rules to skew towards a longer collection period to allow for a new baseline for measuring LP. Consequently, the Pareto 80:20 rule is the aggregate of 20% of the minimum TC and 80% of the maximum TC taken by customers.¹² This implies that a credit period granted between 30 and 90 days means that 20% of customers pay within 30 days whilst the remaining 80% enjoy 90 days, resulting in a Pareto DSO of 78 days $[(20\% \times 30) + (80\% \times 90)]$ whilst 60 days $[(30 + 90)/2]$ are obtained with the use of an Average DSO. The difference between the actual DSO and the Pareto DSO is referred to as Days Overdue based on Pareto rules (DODP) and comparatively the difference between actual DSO and Average DSO is Average Days Overdue (DODA). Both measures indicate LP if the collection period is *higher* than the DSO.

3.4. Model specification

We use Ordinary Least Square (OLS) regression analysis to test the association between profitability (OIROI) (dependent variable) and LP (independent variable). The OLS regression model is as follows:

$$\text{OIROI} = a + B1 \text{ LP_PROXY} + B2 \text{ SIZE} + B3 \text{ GROWTHPOS} + B4 \text{ GROWTHNEG} \\ + B5 \text{ DEBTTL} + B6 \text{ BOARD} + B7 \text{ SECTOR} + B8 \text{ AUDITOR} + e$$

¹² This means, in effect, that 20% of receivables are collected within the shorter credit period, whilst the remaining 80% are paid within the longest or maximum credit period.

We use three different measurements as the proxy for LP (LP_PROXY). Model 1 uses DSO which is the average collection period (ACP); Model 2 uses average days overdue (DODA); and Model 3 uses Pareto days overdue, (DODP).

Where:

OIROI operating income return on investment or operating income to total assets, proxy for profitability

LP_PROXY: DSO, DODA, DODP, where:

DSO days sales outstanding or average collection period (ACP) over 365 Days

DODA average days overdue, i.e. average days overdue from average credit period (DSO) granted over 365 days

DODP Pareto days overdue (based on Pareto Rules) over 365 days

SIZE company's size, represented by the log of total assets (LOGTA)

GROWTHPOS sales revenue growth (2007/2008 vs. 2006/2007) if positive growth

GROWTHNEG sales revenue growth (2007/2008 vs. 2006/2007) if negative growth

DEBTTL short-term and long-term bank borrowings to total liabilities

SECTOR dummy variable for industry sector, coded as '1' for industrial products and '0' for consumer products

BOARD dummy variable for listing board, coded as '1' for Main Board firms and '0' for Second Board firms

AUDITOR dummy variable for auditing firms, coded '1' for Big-Four firms, '0' otherwise

e error term.

3.5. Control variables

This paper uses three control variables, namely firm's size (SIZE), sales revenue growth (GROWTH) and financial debt level (DEBTTL), to examine the association between LP and profitability. It also uses the log value of the total book value of assets to measure SIZE, as per [Gracia-Teruel and Martinez-Solano's \(2007\)](#) study, which finds a positive association between firms' profitability and size. Although firms in our samples are all publicly-listed manufacturing firms, where size could be proxied by market capitalisation (market value of the equity), the logarithm of total assets is used since this study covers only one financial year's cross-sectional data. In addition, the market value is less stable due to the prevailing market conditions and may not reflect proper representation of firm size ([Zainudin, 2008](#)). As a consequence the common proxy based on total assets is used.

Similarly, GROWTH is defined as the change in sales growth and is based on the change in the turnover of sampled firms in 2007 against the 2008 turnover, segregated into two variables: GROWTHPOS, which is the percentage of sales growth if positive (turnover increased from the year before, else zero) and GROWTHNEG as the percentage of sales growth if negative (turnover decreased from the year before, else zero) ([Petersen and Rajan, 1997](#)).

DEBTTL is the proxy for firms' leverage. DEBTTL is the short-term and long-term bank borrowings to total liabilities. It is conjectured that lower leverage is positively associated with financial performance ([Garcia-Teruel and Martinez-Solano, 2007](#)). These three control variables, together with dummy variables, are summarised in [Table 2](#).

3.6. Dummy variables

Three dichotomous dummy variables are used in this study as summarised in [Table 2](#).

3.6.1. Listing board

As profitability is positively associated with company size ([Garcia-Teruel and Martinez-Solano, 2010](#)), we analyse the distinct differences in terms of profitability between large and medium-sized manufacturing

Table 2

Control/dummy variables and expected relationship with profitability.

Control/dummy variable	Proxies/dummies	Expected relationship with DV-OIROI	Applicable theory/conjecture
Company's size (SIZE)	Log (book value of assets)	Positive (+)	Corporate profitability is positively associated with size (Garcia-Teruel and Martinez-Solano, 2007).
Sales growth (GROWTH)	a. GROWTHPOS = Percent sales growth, if positive, zero otherwise	Positive (+)	Indicator of company's business opportunities, an important factor for improved profitability, is positively correlated with profitability (Garcia-Teruel and Martinez-Solano, 2007), and vice versa.
-FYE 2006/07 versus FYE 2007/08	b. GROWTHNEG = Percent sales growth, if negative, zero otherwise	Negative (–)	Company with lower leverage is positively associated with profitability (Garcia-Teruel and Martinez-Solano, 2007).
Financial debt level (DEBTTL)	Short-term and long-term bank borrowings to total liabilities, proxy for leverage (gearing of the company)	Negative (–)	Corporate profitability is positively associated with size (Garcia-Teruel and Martinez-Solano, 2007). Main Board firms which are larger in size are positively associated with profitability.
Listing board (BOARD)	a. Second board (SB) firms, proxy for medium-sized firms, SB = 0 b. Main board (MB) firms, proxy for large firms, MB = 1	Positive (+)	Industrial products sector's DSO/ACP is negatively correlated with financial performance. (Zainudin, 2008)
Industry sector (SECTOR)	a. Consumer products (CP), CP firms = 0 b. Industrial products (IP), IP firms = 1	Negative (–)	Firms with better financial performance engage more with reputable auditing firms – Big4 (Eng and Mak, 2003).
Auditing firm (AUDITOR)	Non-big four (Non-Big4) auditing firms, non-big4 = 0 big four (Big4) auditing firms, Big4 = 1	Positive (+)	

firms (based on Listing Board category¹³). We expect Main Board firms which are larger (measured by the book value of issued paid-up share capital) to be more positively associated with profitability.

3.6.2. Industry sector

In terms of industry sector, the industrial products sector's DSO is expected to be more negatively correlated with profitability and the opposite to be true for consumer products. [Zainudin \(2008\)](#) finds that in the Malaysian SME manufacturing sector, the DSO is negatively correlated with financial performance in the industrial product sector.¹⁴ In general, however, he reports that DSO is independent of financial performance but for the manufacturing sector, industrial product manufacturers' DSO is negatively correlated with financial performance and the opposite is true for consumer products.

3.6.3. Auditor

[Eng and Mak \(2003\)](#) use an auditor's reputation as a dummy variable (Big4 versus Non-Big4) to test the relationship between large and smaller audit firms on corporate disclosure and find no significance. This study uses the same dummy variable to test the association between firms experiencing LP and their auditors. The Big 4 auditing firms, with international and global networks, have the resources and knowledge for their clients' use especially in the area of receivables management.

¹³ The distinction between Main Board and Second Board listing requirements could, in the past, be accessed via www.bursamalaysia.com. However with effect from 3 August 2009, the Main Board and Second Board firms have been merged as Main Market. Main board firms are categorized as large corporations which have a minimum of RM60 million paid-up capital whilst medium-sized corporations are represented by Second Board firms which have a minimum paid-up capital of RM40 million.

¹⁴ This includes machinery and engineering, chemical and petrochemical products, transport equipment, metal products and wood and wood products.

4. Sample selection and data description

Most prior studies of LP examining firms outside Malaysia are based on data from survey questionnaires (Summers and Wilson, 2000; Pike and Cheng, 2001; Paul and Wilson, 2006) whilst in Malaysia, prior studies of receivables and corporate performance concentrate on DSO data extracted from published financial statements (Angappan and Zainudin, 2003; Zainudin, 2008). In this study, data is obtained from Reuters' official website¹⁵ extracting information from balance sheets and profit and loss accounts for the financial year 2007¹⁶ for all listed manufacturing firms in Malaysia (under the consumer and industrial products sector in Bursa). The reason this secondary data collection method was pursued is explained next.

A preliminary exploratory study¹⁷ of credit management in Malaysia revealed several concerns: i) difficulties in assessing customers' creditworthiness due to information unavailability, ii) unavailability of corroborative evidence (not verifiable, accurate, or timely) and iii) reluctance on the part of firms to divulge information on TC deemed sensitive, confidential, or detrimental to their business or reflecting a negative impression of the management, especially if the information on LP was adverse. Given such concerns and being cognisant that discourse on credit management is still in its infancy, we envisage that credit management research based on primary data obtained from a survey will not be feasible. Even in a more developed economy such as the UK, the LP phenomenon is very complicated as it is often associated with a range of factors (such as bargaining power, competitiveness of markets, technology changes, customer concentration, demand seasonality, credit scoring, capital rationing and financial distress) that all contribute to delinquency or default risk (Paul and Wilson, 2006).

Our initial sample covered approximately 95%¹⁸ of 409 listed manufacturing firms. Then those with other than a 12-month financial year (owing to a change of accounting period) and those without available audited financial statements (e.g. distressed firms) were excluded leaving 388 firms. From these a further 101 were removed (96 did not disclose credit periods granted and a further five (outliers) had DSOs of more than 18 months,¹⁹ leaving a final sample of 287 firms, representing 70% of listed manufacturing firms.

4.1. Descriptive statistics

Table 3 shows the disclosure of credit periods granted by firms in the sample and is primarily based on intervals (e.g. 60–90 days) not absolute numbers of credit days given. To arrive at the number of days overdue, Pike and Cheng (2001) use the difference between DSO and the average credit period granted. For example, if the interval is 60 to 90 days (average 75) and the DSO is 80 then the days overdue (DODA) is 5.

Based on the 287 selected firms, the most common credit period granted in the manufacturing sector is between 30 and 90 days. An extract shows a typical disclosure note: '...the Group's normal trade credit terms range from 30 to 90 days. Other credit terms are assessed and approved on a case-by-case basis' (Annual Report 2008, HeveaBoard Berhad, p. 65).

Table 4 shows that, based on average days overdue, 60% of listed manufacturing firms in Malaysia experience LP. Further analysis shows that, to a certain extent, large firms suffer less than medium-sized firms in the manufacturing sector, which is in line with Paul (2010). Additionally, 51% of Main Board manufacturing firms experience LP problems compared to 71% of Second Board manufacturers.

In terms of industry sector, 65% of industrial product manufacturing firms experienced LP compared to 48% of consumer product manufacturers. Furthermore, medium-sized industrial product manufacturers

¹⁵ www.reuters.com/finance.

¹⁶ The audited accounts of the sample firms were downloaded from Bursa official website at www.bursamalaysia.com.

¹⁷ This exploratory study was conducted between 2005 and 2006 on ten large and medium-sized firms of which five are listed firms and the remaining are multinational firms.

¹⁸ Based on Bursa Malaysia's official statistics of listed companies, the population was 409 companies as at the 31 December 2007. Then companies that were not active/without principal businesses with some awaiting for delisting proceedings by Bursa Malaysia were excluded from the initial sample, leaving an initial coverall of 95%.

¹⁹ The DSO of the 287 companies in the sample is 89 days. This excludes five extreme cases with a DSO of 608, 849, 869, 811 and 579 days. These cases are outliers and thus have been excluded from the sample. In fact, the results are still significant, though different, even when we include these outliers.

Table 3

Disclosure of credit period granted and derivation of average and Pareto credit period.

Credit terms/period disclosed in audited accounts 2007/8 (in ranges of day)	Average CT in days	Pareto CT in days
30–60	45	54
30–90	60	78
30–120	75	102
45–60	52.5	57
60–90	75	84
60–120	90	108

Source: Compiled from audited financial statements downloaded from www.bursamalaysia.com.

suffered the most with 77% of firms experiencing the LP problem. This is consistent with our expectations, and Zainudin's (2008) findings, on the DSO of both sectors, that the fast-moving consumer product manufacturers with higher elasticity in demand are better off than the industrial product manufacturers' capital or durable goods with more inelastic demand.

Table 5 shows that firms in the sample have a high ARTA (18%) and that receivables are the most important component of the working capital, overtaking inventory (17.5%). This signifies that receivables represent the highest proportion of short-term assets for Malaysian manufacturers, implying that TC management is indeed a neglected area in many firms. As ARTA (18%) is significantly higher than APTA (9.5%), most firms are net TC providers and thus need short-term financing (internally/externally generated funds) which increases their costs.

5. Results

5.1. Correlation analysis

Table 6 shows a positive correlation between Listing Board and size (LOGTA) at 0.579 (relatively high). The decrease in revenue growth (GROWTHNEG) with a relatively high positive correlation with OIROI, at 0.487, is somewhat surprising: we expected the opposite correlation and this is discussed in Section 5. The correlation matrix confirms that no multicollinearity exists between all the other variables as none of these variables correlate above 0.8 (Nunnally, 1978; Gujarati, 2006). All variables' correlation are less than 0.7 in this study. To further test multicollinearity, we computed the variance inflation factor (VIF) statistic (the reciprocal of one minus the R-squared) for all combinations of regressors, giving a total of 24 statistics (8 statistics for each of DSO, DODA and DODP). None of these statistics exceed 2. The generally accepted rule of thumb is that figures exceeding 10 are problematic (Janke and Tinsley, 2005). We therefore conclude that multicollinearity is not a serious problem in our case.

Table 4

Company size and LP.

Listing board: main board vs. second board (No. of firms)	LP from debtors	LP percentage (%)	Payment (PP) from debtors	PP percentage (%)	Total samples
<i>Main board (Large)</i>					
Consumer products	28	44.44%	35	55.56%	63
Industrial products	60	55.56%	48	44.44%	108
Sub-total	88	51.46%	83	48.54%	171
<i>2nd board (Medium-sized)</i>					
Consumer products	19	55.88%	15	44.12%	34
Industrial products	63	76.83%	19	23.17%	82
Sub-total	82	70.69%	34	29.31%	116
Total samples	170		117		287
Percentage (%)	59.23%		40.77%		100%

Table 5

Significance of each of the main components of the current assets over total assets of manufacturing sector.

Component of current assets versus fixed assets	Abbreviation	Mean	Median
Account receivables to total assets	ARTA	18.0%	17.5%
Inventories to total assets	INVTA	17.5%	15.6%
Accounts payables to total assets	APTA	9.5%	7.5%
Net fixed assets (net) to total assets (proxy for collateral)	NFA/TA	35.5%	34.5%

Table 6

Pairwise correlation matrix for the association between LP and profitability.

	OIROI	DSO	DODA	DODP	LOGTA	GROWTH POS	GROWTH NEG	DEBTTL	BOARD	SECTOR	AUDITOR
DSO	−0.260**	1.000									
DODA	0.080	N/A	1.000								
DODP	0.238**	N/A	N/A	1.000							
LOGTA	0.286**	−0.243**	0.197**	0.206**	1.000						
GROWTHPOS	0.182**	−0.109*	−0.044	0.045	0.012	1.000					
GROWTHNEG	0.487**	−0.225**	−0.033	0.227**	0.201*	0.102*	1.000				
DEBTTL	−0.187**	0.068	−0.045	−0.008	0.076	−0.157**	−0.093	1.000			
BOARD	0.310**	−0.150**	0.140	0.123*	0.579**	0.054	0.130*	−0.118*	1.000		
SECTOR	−0.073	0.075	−0.114	−0.083	0.037	0.091	−0.019	0.084	−0.078	1.000	
AUDITOR	0.072	−0.083	0.106*	0.000	0.247**	0.023	−0.016	−0.101*	0.165	0.084	1.000

**, * denote significance at 5%, 10% level respectively.

5.2. Multivariate analysis

OLS regression analyses have been performed on the three models to test the impact of LP on profitability (results summarised in Table 7). The days overdue based on Pareto rules (DODP) show a significant association, at 5% level and an R^2 of 32.5%, confirming the inverse relationship between LP and profitability (measured by OIROI). This implies that any DODP reduction improves the profitability. Similarly, collection promptness (measured by DSO) also shows a significant association, at a 5% level and an R^2 of 32.5%.

Contrary to previous studies, Model 2, using DODA as a measure of LP, is not statistically significant in explaining the effect of LP on profitability. Whilst prior research derived this measure from questionnaire survey responses, in this study the measure was computed from published information. The findings raise concern about the reliability of such published information²⁰ in the Malaysian context.

We also find that company size, based on total assets, has no impact on profitability. This is in not in line with Garcia-Teruel and Martinez-Solano (2010) who find a positive association between size and profitability where larger firms generate higher profits. However, when size is based on the classification of the Listing Board in Malaysia (size of paid-up share capital), we find that Main Board firms perform better compared to their counterparts in the Second Board, significant at 1% in all three models. This is consistent with the findings of Garcia-Teruel and Martinez-Solano (2010).

In all three equations, firms' growth is significantly associated with profitability, with both increases and decreases in the growth variables, and is statistically significant at 1%. Whilst the positive association between increase in revenue growth and financial performance is expected, the positive association between decrease in growth and profitability is somewhat puzzling and needs further investigation. A decrease in growth is expected to have an inverse relationship with profitability as fewer sales are expected, generally reducing the OIROI whilst operating overhead costs have to be sustained. Nevertheless, as firms in our sample are well-established publicly listed manufacturing firms, with relatively easy access to capital markets, they may have adequate sales volume to cover fixed overheads despite the decrease in growth. Moreover, they tend to be

²⁰ Previous studies obtained DODA data from questionnaires on the average number of late collection days experienced by respondents as opposed to the quantitative derivation in this study.

Table 7

Association between late payment and profitability (OIROI) with alternative measurements.

Variable	Model 1 (DSO)		Model 2 (DODA)		Model 3 (DODP)	
	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat
DSO	−0.063	−2.152**				
DODA			−0.033	−1.008		
DODP					−0.057	−1.89**
SIZE	0.018	1.355	0.021	1.523	0.019	1.362
GROWTHPOS	0.01	2.585***	0.011	2.626***	0.01	2.674***
GROWTHNEG	0.309	4.98***	0.325	5.38***	0.308	4.946***
DEBTTL	−0.041	−2.053**	−0.041	−2.098**	−0.043	−2.158**
BOARD	0.033	3.05***	0.033	2.996***	0.033	3.037***
SECTOR	−0.011	−0.842	−0.011	−0.878	−0.011	−0.835
AUDITOR	0.002	0.204	0.002	0.22	0.004	0.332
C	0.04	1.268	0.022	0.723	0.024	0.773
Adjusted R ²	0.325		0.318		0.325	
F-statistic	18.198		17.657		18.191	
N	287		287		287	

Notes: the coefficients are estimated using OLS and the reported t-statistics are White-adjusted values to control for heteroscedasticity. ***, **, * denote significance at 1%, 5%, 10% level respectively.

more selective in choosing more profitable customers who can be relied on to pay on-time. This usually results in improved margins, cash flow and coverage of overheads, thus displaying better profitability despite the decrease in revenue growth. Leverage is strongly associated with profitability in all three equations with a significance at 5%, implying that the lower the gearing the greater the profitability.

In conclusion, our results show that there is an association between LP and profitability in the Malaysian manufacturing sector. Credit terms may be varied across industries according to their practices and norms and these overdue day variables are indeed a better measurement of LP than a simple average. However, in the emerging countries context DODP provides a more appropriate measure of LP.

6. Implications

This study evidences that a way of measuring LP can be obtained from the disclosures in the annual reports of firms and that days overdue (the measurement of LP) can be computed using averaging method and the Pareto rule. Whilst simple averaging has been used in more developed countries, its application in an emerging country, such as Malaysia, is questionable.

This study uses DODP as an alternative measure of LP and finds that it provides a more appropriate way to analyse. On the other hand, the days overdue based on simple average (DODA) as used by Pike and Cheng (2002) appears to be a less appropriate measure for LP in this empirical study as the regression results are not significant. Whilst most prior research, conducted in developed countries, obtained DODA data from questionnaires (where respondents were asked to indicate their average number of days of late collection), in this study the DODA is computed from published data on the range of the credit period extended. This overcomes the possibility of bias in questionnaire data. Furthermore, the adoption of IFRS 7 by Malaysian firms, will improve the reliability of disclosures.

This study contributes to TC management literature by empirically quantifying the late collection of debts and by extending the concept of average days overdue (DODA) used by Pike and Cheng (2001) to days overdue based on the Pareto rule, more reflective of practices in Malaysia's manufacturing sector.

The implications of these findings are threefold. Firstly, they serve as a wake-up call to corporate Malaysia, and this may equally apply to other emerging economies in Asia and elsewhere that are in the process of adopting IFRS 7.²¹ The study also implies the reluctance of firms to disclose information regarding the collectability of their account receivables. Given such reluctance, the adoption of IFRS 7 in January 2010 is

²¹ The Malaysian version which is exactly the same as IFRS 7 is known as Financial Reporting Standard (FRS) 7 which became mandatory from 1 January 2010.

problematic as this requires careful monitoring by regulators such as the Securities Commission, of compliance with IFRS 7 disclosures by listed firms. Secondly, the significance of prompt collection and its impact on profitability means that investors, and indeed other users of financial statements of listed firms, have to make more effort in interpreting the credit management efficiency of firms and carefully perusing the disclosures made by them. Thirdly, the Board of Directors and the Audit Committees of listed firms may have to review the disclosures and monitor the collection promptness of their firms.

7. Limitations and suggestions for future research

This is an exploratory study. It sets out to examine the association between LP and profitability in an emerging economy where published data leaves much to be desired. The issue of whether financially constrained firms behave differently is not examined in this study. It is suggested that future research embark on using the LP measure developed in this paper to capture firms' financial constraints and liquidity risk (Shenoy and Williams, 2011).

Furthermore, this study examined only one year i.e. 2007 which was before the 2008 financial crisis. A further examination of this phenomenon over a number of years before and after the crisis will be useful in highlighting the variation in trade credit policies across firms over time. This study used a one year cross-sectional dataset and does not consider a horizon of time series. As a result there is a concern with the possible occurrence of endogeneity, and it is suggested (Wooldridge, 2002) that an investigation of this phenomenon over a number of years would alleviate this. Moreover, endogeneity is a problem faced by many empirical studies given that economic activities are complex and causality does not always go in one single direction. When data is available, this can be partially solved by adopting instrumental variable techniques. Unfortunately, due to data limitations, we do not have the additional instruments (variables that are correlated with the endogenous explanatory variable but not correlated with the error term) to deal with this problem. The sample covers listed manufacturing firms and hence any generalisation to other sectors should be treated with caution.

The study examined profitability as the dependent variable. It will be interesting to examine whether LP increases the risk to the firm and thus its equity value. Future research could examine the buy-and-hold stock returns as a dependent variable.

8. Concluding remarks

Given the unavailability of information on the promptness of receivables collection, and thus the occurrence of LP (together with the absence of disclosure rules pending implementation), the information required for this study was obtained from secondary data. From this we were able to develop an appropriate measure for LP that indicates an association between LP and profitability and we found that LP is a real problem in Malaysia. Consequently, those who collect and manage receivables will have to be effective in minimising LP and mitigating the risk of default. Furthermore, this study shows that the enhanced disclosure requirements from IFRS 7 are indeed useful, at least from the perspective of TC disclosures.

The findings of this empirical study on LP issues serve as the initial point for future researches across Asian and other emerging countries. Also a comparative study between countries may be possible with global economies moving towards common financial reporting standards, using Pareto days overdue to measure LP. Moreover, it will be interesting to examine whether cultural and socio-economic differences between the Western and Asian economies impact the payment patterns of receivables and whether Pareto days overdue is a better measure of LP in the context of emerging markets only. This will be explored by future comparative studies.

The world is converging toward a single set of global financial reporting standards and, with the increased disclosure requirements for receivables under *IFRS 7: Financial Instruments: Disclosures*, promulgated by the International Accounting Standards Board, studies on LP may gain relevance in the marketplace.

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